SMART ELECTRONIC TOLL SYSTEM USING BARCODE READER

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ABSTRACT

The present manual toll collection is not efficient over highway transportation in current road network thus, to collecting the toll and traffic management we introduce a new system with advance technology is smart electronic toll collection system using barcode reader. This device collects information of vehicle passing through the toll plaza and automatically debits the toll amount from prepaid account which is linked to the vehicle insurance, When the vehicle will pass through toll gate the barcode reader scans the barcode on the insurance paper .The laser light emitted by the barcode reader reads the data from insurance paper and amount of toll will automatically be reduced from the prepaid account. This makes less traffic congestion and toll transaction more convenient for the public use.

Keywords: Arduino UNO, Barcode reader, Insurance paper, Vehicles

I . INTRODUCTION

In today's world highway plays a important role in social and economical development, due to the development of economy the growth of highway becoming faster. A manual toll collection system will consume more time, due to the number of vehicle passing through the toll thus the vehicle are passing in a long queue through toll plaza. To overcome these problem we propose an Smart Electronic Toll Collection System using barcode reader. It is a technology for collection of toll to reduce the traffic congestion near the toll [1].

Electronic toll collection utilizes Barcode Reader technology. It contains Barcode reader which fetch the information via barcode available on the Vehicle Insurance paper. Each barcode has a unique identity number. The barcode which is printed on the Insurance paper is detected by the barcode reader and data is matched with the database provided at every toll booth, toll amount is deducted from prepaid account which is linked to Insurance, immediately gate is opened and message will be sent to registered mobile number.

There are many benefits of using smart toll collection system such as ; less traffic time, reduction in air pollution, user friendly, automated(as no human interference for payment detection) and virtual

payment. smart toll collection system also helps in detecting the validity of the vehicle insurance and also gives information about invalid insurance.

II. RELATED WORK

2.1 **Toll collection using image processing**

 In these system number plate is detected using image processing. These system required camera as a input source.   Through the image captured by camera it access the data . It has advantages such as error free detection and it is very reliable. The disadvantages are cost is more and it is difficult to design and program[3,4].

2.2 **Toll Collection Using RFID**

RFID works with the help of radio frequency . Each RFID tag has unique identification number and RFID reader reads the data from the tag. Advantages such as easy to access and low cost to implement. The disadvantage are RFID tags are difficult to detect in speed vehicles[2,4,5].

III. PROPOSED WORK

The proposed system provides a base for barcode detection using barcode reader for toll collection at toll checkpoints. This system will help in saving time as well as help in reducing congestion at toll checkpoints. This system will also help in detecting theft vehicle passed through the toll using database recorded at the toll.
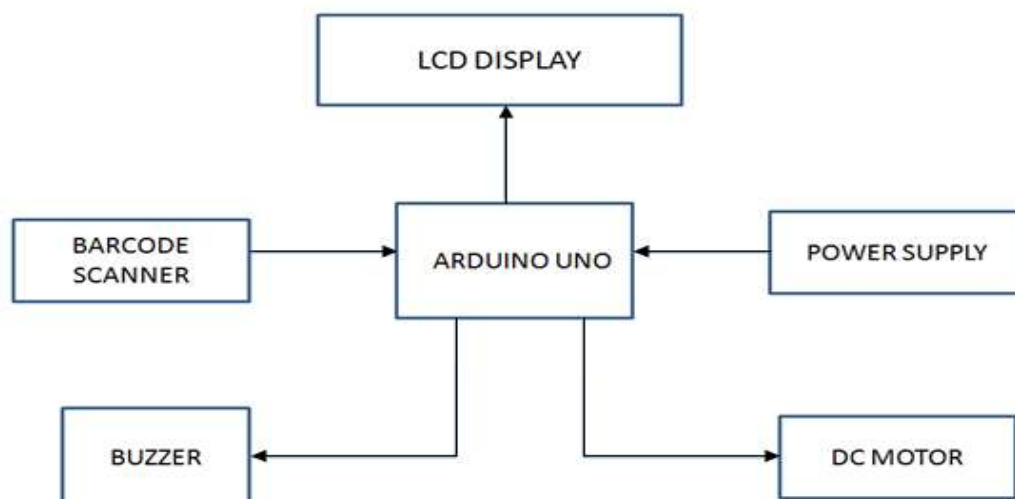
3.1 **BLOCK DIAGRAM**

Fig. 1.1 Block diagram of Smart electronic toll collection system.

3.1 **ALGORITHM**

Step 1 : With the help of a barcode reader, the barcode present on the vehicle insurance paper will be scanned.

Step 2 : Once the vehicle number is extracted from the barcode, it will be compared and searched in the centralize database and the respective vehicle owner's details will be fetched.

Step 3 : Along with the details, it will also check whether the insurance is expired or not.

Step 4 : If the vehicle insurance has valid date, then go to step 5 .Else buzzer ON.

Step5:Toll amount will be deducted from the vehicle owners prepaid account .

Step6 : Once the amount is deducted toll gate will be opened.

Step7: Go back to step1.

VI. RESULTS AND DISCUSSIONS

The results of proposed system are practically implemented. there are various ways that we can show the expected results. Results of the designed system are attached below.

1) The image shows the welcome message on LCD.

Fig 1.2 Initial Display

2) One of the result shows that passed vehicle is Car and available balance is Rs. 450.

Fig 1.3 Vehicle Details

3) After deduction of sufficient balance the LCD shows Transaction is successful.

Fig 1.4 Completion Process

Smart electronic toll collection system will displays the welcome note as shown in the above fig (1.2), once the barcode is read by the barcode reader it compares the recieved details with available details and display the vehicle details as shown in fig(1.3), gate is opened once the amount is deducted and display the fig(1.4)

V. CONCLUSION

The proposed electronic toll gate system applies barcode technology. Barcode scanning is the best way to prevent time complexity. It has characteristics of low cost, high security, and high efficiency, etc. Electronic toll collection system is an effective measure to reduce management costs and fees, at the same time, greatly reduce noise and pollutant emission of toll station. This reduces the manual labour and delays that often occur on roads. This system of collecting tolls is eco-friendly and also results in collection of toll easy.

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